

WHAT IS CLAIMED IS:

1. A method for detecting images of an object, comprising:  
illuminating the object with a light source;  
imaging the object onto a detector using an imaging system so as to provide a detected image;  
generating a reference image taking into account at least one property of the imaging system;  
comparing the detected image to the reference image; and  
varying, upon a definable deviation between the detected image and the reference image, the reference image so as to provide a varied reference image that at least largely corresponds to the detected image so as to enable a drawing of at least one conclusion regarding the object.
2. The method as recited in claim 1 wherein the method is usable for determining a localization of the object relative to a reference point.
3. The method as recited in claim 1 wherein the detector includes a CCD camera.
4. The method as recited in claim 1 wherein the generating a reference image is performed by generating an image characterizing the at least one property of the imaging system.
5. The method as recited in claim 4 wherein the generating the image characterizing the at least one property of the imaging system is performed by detecting a known object with the imaging system.
6. The method as recited in claim 5 wherein the detecting the known object is performed by detecting the known object at a plurality of angular positions in a plane of the object.

7. The method as defined in claim 5 further comprising extracting an analytical function from a detected image of the known object, the analytical function characterizing the at least one property of the imaging system.
8. The method as defined in claim 7 wherein the analytical function is represented by a symmetrical or asymmetrical Struve function.
9. The method as recited in claim 1 wherein the generating a reference image is performed by generating a function characterizing the at least one property of the imaging system.
10. The method as recited in claim 9 wherein the generating a function characterizing the at least one property of the imaging system is performed by calculation or simulation.
11. The method as recited in claim 10 wherein the simulation is performed using an optics simulation program.
12. The method as recited in claim 1 wherein the generating a reference image is performed by generating using calculation or simulation an artificial ideal image corresponding to the object.
13. The method as recited in claim 12 wherein the generating an artificial ideal image is performed using a digital image processing method.
14. The method as recited in claim 12 wherein the generating a reference image is performed by generating an image characterizing the at least one property of the imaging system and by calculation using the generated artificial ideal image and the generated image characterizing the at least one property of the imaging system.

15. The method as recited in claim 12 wherein the generating a reference image is performed by generating a function characterizing the at least one property of the imaging system and by calculation using the generated artificial ideal image and the generated function.
16. The method as recited in claim 14 wherein the calculation using the generated artificial ideal image and the generated image characterizing the at least one property of the imaging system includes a mathematical convolution operation.
17. The method as recited in claim 15 wherein the calculation using the generated artificial ideal image and the generated function includes a mathematical convolution operation.
18. The method as recited in claim 4 further comprising storing the generated image characterizing the at least one property of the imaging system.
19. The method as recited in claim 9 further comprising storing the generated function characterizing the at least one property of the imaging system.
20. The method as recited in claim 1 further comprising storing the generated reference image.
21. The method as recited in claim 20 wherein the comparing the detected image to the reference image is performed using a computer and wherein the storing is performed so as to store the generated reference image on the computer.
22. The method as recited in claim 1 wherein the varying the reference image is performed by varying at least one of a feature and a shape of the object.
23. The method as recited in claim 22 wherein the generating a reference image is performed by generating using calculation or simulation an artificial

ideal image corresponding to the object and wherein the varying at least one of a feature and a shape of the object is performed by varying at least one of a feature and a shape of the generated artificial ideal image.

24. The method as recited in claim 1 wherein the comparing the detected image to the reference image is performed using a quality function.

25. The method as recited in claim 24 wherein the comparing the detected image to the reference image using a quality function is performed using at least one of statistical and numerical evaluation steps.

26. The method as recited in claim 1 further comprising:  
comparing the detected image to the varied reference image; and  
varying, upon a definable deviation between the detected image and the varied reference image, the varied reference image so as to provide a second varied reference image that at least largely corresponds to the detected image so as to enable a drawing of at least one conclusion regarding the object.

27. A microscope for detecting images of an object, comprising:  
a light source for illuminating the object;  
a detector;  
an imaging system for imaging the object onto the detector so as to provide a detected image; and  
a computer configured to:  
generate a reference image taking into account at least one property of the imaging system;  
compare the detected image to the reference image; and  
vary, upon a definable deviation between the detected image and the reference image, the reference image so as to provide a varied reference image that at least largely corresponds to the detected image so as to enable a drawing of at least one conclusion regarding the object.

28. The microscope as recited in claim 27 wherein the microscope is a coordinate measuring instrument.
29. The microscope as recited in claim 27 wherein the microscope is capable of determining a localization of the object relative to a reference point.
30. The microscope as recited in claim 27 wherein the detector includes a CCD camera.